

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.



United States
Department of
Agriculture

Agricultural
Cooperative
Service

ACS Research
Report 109

Agronomy Operations of Local Cooperatives



Agronomy Operations of Local Cooperative

John R. Dunn
Beverly L. Rotan
E. Eldon Eversull

This report examines the sales and sales methods that local cooperatives used to sell agricultural chemicals and fertilizers and how these factors affected the cooperatives' sales of these products from 1983 through 1988. Data gathered through a special survey about sales and sales methods of these two products were combined with data from the annual Agricultural Cooperative Service surveys. Of the original 868 cooperatives in 1985, 91 merged with other cooperatives, went out of business, or were sold to investor-owned firms by 1990.

Keywords: local cooperatives, agricultural chemicals, fertilizers, sales.

ACS Research Report 109
January 1993

Preface

Local cooperative sales and sales methods of two important farm inputs, agricultural chemicals and fertilizers, are documented in this report. Financial ratios and the economic strength of 868 cooperatives over a 6-year period are discussed.

The authors wish to thank the personnel of the local cooperatives that responded to the original survey and also responded to the yearly Agricultural Cooperative Service (ACS) surveys. The input received from regional cooperative personnel on questionnaire design is also appreciated.

Finally, this study would not have been possible without the assistance of the ACS Statistical and Technical Services Staff which provided the additional information necessary from 1983, 1985, 1987, and 1988.

Contents

Highlights	iv
Profile of Respondent Cooperatives	2
Cooperative Size	2
Cooperative Type	2
Cooperatives That Ceased To Exist.....	5
Local Cooperative Sales Profile.....	5
Specialized Marketing Cooperatives.....	9
Mixed Marketing Cooperatives.....	9
Mixed Farm Supply Cooperatives	9
Specialized Farm Supply Cooperative	9
Sales by Cooperatives Experiencing Major Structural Change	13
Local Cooperative Financial Profile	14
Specialized Marketing Cooperatives.....	17
Mixed Marketing Cooperatives.....	19
Mixed Farm Supply Cooperatives	21
Specialized Farm Supply Cooperatives	21
Cooperatives That Ceased To Exist.....	23
Cooperatives That Grew Through Merger/Acquisition	23
Sales Volume Analysis.....	25
Agricultural Chemicals.....	25
Fertilizer	28
Product Selection	30
Services and Sales Tools.....	32
Provision of Agronomy Services	33
Sales Tools	38
Trade Territories	40
Competitor Analysis	41
Conclusions and Challenges for Local Cooperatives	44
Environmental Concerns.....	45
Market Restructuring	45
Alternative Agricultural/Biotechnological Advances	46
Bibliography	46

Highlights

Agricultural cooperatives played a vital role in providing agricultural chemicals and fertilizers to U.S. farmers in the 1980's. Cooperatives had one of the most extensive distribution systems for agricultural inputs and sold more than \$4.9 billion worth of these two products in 1990. Basic to the fertilizer industry, cooperatives owned mining and manufacturing facilities as well as distribution terminals. In the agricultural chemical industry, cooperatives generally acted as distributors or dealers of agricultural chemicals manufactured by large petrochemical firms.

The information from the 868 local cooperatives that responded to an agricultural chemical and fertilizer survey was combined with annual surveys conducted by ACS. For this study, cooperatives were divided into four groups based on their mix of total sales between supplies sold and farm product marketings. They were also divided into four size categories, based on their total sales volume. In addition, information on the 91 cooperatives in this study that ceased to exist was segregated where appropriate.

From 1983 to 1988, respondent cooperatives' agricultural chemical sales grew at an average of 12 percent a year. Fertilizer sales grew by more than 5 percent a year.

The asset base of the average respondent marketing or farm supply cooperative ranged from just less than \$4 million in 1983 to almost \$5 million in 1988. Members of these cooperatives held almost \$3 million in owner equity in 1988. Net value of physical assets was more than \$1.5 million. On average, long-term liabilities fell more than \$200,000 between 1983 and 1988.

Cooperatives that grew through merger or acquisition had significantly more assets than the average cooperative. In 1988 they had about \$1.5 million more in property, plant, and equipment, and more than \$3 million in total assets. The merger with or acquisition of another cooperative apparently was done without the use of large amounts of long-term debt. These cooperatives averaged only \$300,000 in additional long-term debt while they had almost \$2 million more in owner equity than the average cooperative.

Agricultural chemical and fertilizer revenues for respondent cooperatives consist of the product sales volume and other services revenues. Product sales provided 96 percent of total agricultural chemical and fertilizer revenues. Custom application charges were almost 4 percent of the sales volume for agricultural chemicals and 2.6 percent for fertilizer sales. Mixed marketing cooperatives, the largest group of respondents, had the highest sales volume of both products.

Regional or interregional cooperatives supplied more than 75 percent of the agricultural chemicals and 85 percent of the fertilizer that respondent cooperatives sold. Respondent cooperatives felt that competitors, both non-cooperative suppliers and other dealers, exerted the most pressure on the types and brands of agricultural chemicals and fertilizer that they offered for sale.

Among the types of cooperatives, specialized farm supply cooperatives had the largest trade territory radius. Surprisingly, among the size groups, small cooperatives had the largest trade territory—at more than 23 miles—of all sizes

Highlights

of cooperatives. Most cooperative sales of agricultural chemicals and fertilizers were made to medium-sized farms with annual farm product marketings of more than \$20,000 and up to \$200,000.

There was an average of nine non-cooperative distributors, and dealers and brokers, within the trade territory of respondent cooperatives. These competitors had the most influence on what agricultural chemical or fertilizer the cooperatives sold.

Most agricultural chemical sales (63 percent) were sold directly to farmers without application service. In direct contrast, most fertilizer sales (73 percent) included either custom application by the cooperative or farmers using cooperative-owned application equipment. To recover the application cost of agricultural chemicals and fertilizer, cooperatives usually charged an additional service fee.

Offering advisory services and advertising were clearly the highest rated methods or tools in holding onto agricultural chemical customers. To gain new customers, handling other supplies and marketing farm products were viewed as being most important.

The most important tools for keeping fertilizer patrons were judged to be price and application services by all groups except for small cooperatives. Small cooperatives felt that handling other farm supplies was slightly more important than price. Advertising was viewed as the most important method for attracting new fertilizer patrons.

Agronomy Operations of Local Cooperatives

John R. Dunn
Beverly L. Rotan
E. Eldon Eversull

Agricultural cooperatives played a vital role in providing agricultural chemicals and fertilizers to U.S. farmers in the 1980's. Cooperatives had one of the most extensive distribution systems for agricultural inputs. Sales of these two products by cooperatives in 1990 totaled more than \$4.9 billion. Cooperatives were basic in the fertilizer industry, owning mining and manufacturing facilities as well as distribution terminals. In contrast, cooperatives generally act as distributors or dealers of agricultural chemicals manufactured by large petrochemical firms.

Cooperative market share for both agricultural chemicals and fertilizers supplied to U.S. farmers for agricultural production remained fairly constant in the 1980's. Cooperative market share of agricultural chemicals was 30 percent in 1990. Fertilizer market share dropped slightly from 45 percent in 1980 to 43 percent in 1990.

Farmers spent \$5.7 billion for agricultural chemicals in 1990. This total was divided among the three major agricultural chemicals used by farmers: herbicides, insecticides, and fungicides. In 1990, the majority of herbicides purchased were used on land planted to corn or soybeans. Insecticides were most often used on land producing corn and cotton. Fungicides were most heavily used in growing peanuts.

In 1990, farmers spent \$7.1 billion on fertilizers used for farm production. There were three main fertilizer nutrients: nitrogen (N); phosphate (P); and potash (K). Smaller amounts of sulfur and micronutrients also were sometimes present in fertilizer. Fertilizer use peaked in 1981 at 23.4 million tons of plant nutrients and fell to 20.6 million tons in 1990.

PROFILE OF RESPONDENT COOPERATIVES

To assess the agronomy operations of local cooperatives, the Agricultural Cooperative Service (ACS) sent a survey to all local cooperatives that sold at least \$0.5 million of agricultural chemicals and fertilizers in 1985. The total of local cooperatives that fit this description was 1,732. The agricultural chemical and fertilizer (ACF) survey asked detailed questions about sales, sales methods, and what the cooperatives felt exerted the strongest influences on sales. Of the 1,732 surveyed, ACS received 868 usable responses, for a total response rate of 50 percent.

The information from the 868 local cooperative respondents was then combined with annual surveys that ACS conducts to get a more complete summary of these cooperatives' agricultural chemical and fertilizer sales. The annual surveys from the years 1983, 1985, 1987, and 1988 were used. The years 1983 and 1987 were census years for ACS data collection. In a census year, all agricultural cooperatives were sent an ACS survey. In 1985 and 1988, only a sample of the local agricultural cooperatives was sent an ACS survey. As a result, the number of ACF survey cooperatives for whom ACS survey data was available was considerably smaller for these years.

The annual ACS survey asked for dollar volume of agricultural products marketed by the cooperative and farm supplies sold. Basic balance sheet items (total assets, total liabilities, and net worth) and an income statement item (net margins), were also collected. By combining this information with the ACF survey, a more detailed analysis of these cooperatives' sales growth and financial strength was possible. Because of the level of response on the annual surveys and throughout the remainder of this report, the number of cooperative respondents to the ACS annual survey often differed from those originally used in examining sales volume or financial information. Not all surveys had complete sales or financial information; if either of these two was missing, the cooperative was omitted for that specific year or years from the sales or financial profiles.

More than 80 percent of the respondents to the agricultural chemical and fertilizer survey were located in the Corn Belt, Lake States, and Northern Plains (table 1). The Corn Belt and Lake States regions were somewhat overrepresented in this study when compared with all U.S. grain marketing and farm supply cooperatives while those in the Northeast and Northern Plains were underrepresented.

To obtain a more complete understanding of the local cooperatives' agronomy business, several business size and type groupings of cooperatives were used in this study. Information provided in the ACF survey was divided into four sizes of cooperatives and four types of cooperatives.

Cooperative Size

Cooperatives were grouped into sizes by sales volumes. The sales volume figures used were actual. Since prices were fairly stable during the 1983 to 1988 period, no attempt was made to deflate sales volume. The sales groupings used were: 1) small cooperatives with sales less than \$5 million; 2) medium cooperatives with sales from \$5 million to \$10 million; 3) large cooperatives with sales from \$10 million to \$20 million; and 4) super cooperatives with a sales volume in excess of \$20 million.

The size groupings and names assigned to them were somewhat arbitrary. Clearly an \$8 million cooperative that exclusively marketed grain was small relative to most grain marketing organizations. A strictly farm supply cooperative with sales of \$8 million, however, was quite substantial. In classifying by total sales alone, product mix was ignored.

Cooperative Type

To account for differences in operations and orientation based on product mix, cooperatives were grouped into one of four descriptive categories: 1) Specialized marketing cooperative; 2) Mixed marketing cooperative; 3) Mixed farm supply cooperative; and 4) Specialized farm supply cooperative. These descriptive types of cooperatives were chosen to represent business operations

of these cooperatives as closely as possible. After types were determined for each cooperative, data from the four ACS survey years were analyzed to determine the frequency of change of a cooperative from one of these types to another. Over the four survey periods, very few cooperatives actually migrated from one type to another. Thus this classification scheme was quite stable over the study period.

In this study, a specialized marketing cooperative derived more than 75 percent of its sales volume from marketing member and nonmember farm products. This meant that up to 25 percent of the sales volume of these cooperatives could be from selling farm supplies. The products marketed were represented in any 1 of the 11 presented in table 2.

A mixed marketing cooperative derived between 50 and 75 percent of its total sales from product marketings. The remaining 25 to 50 percent of revenues came from sales of farm supplies and other sources.

A mixed farm supply cooperative derived between 75 and 90 percent of its sales volume from selling farm supplies to members and nonmembers. This meant that between 10 and 25 percent of these cooperatives' sales volume was from marketing farm products. Farm supply sales volume information collected by ACS fell into 11 groupings shown in table 2.

The final type of cooperative was a specialized farm supply cooperative that derived more than 90 percent of its sales volume from selling farm supplies to members and nonmembers. Most

Table 1—All U.S. grain marketing and farm supply cooperatives compared to all respondent cooperatives and to respondent cooperatives that ceased to exist, by region, 1990

Region ¹	All grain marketing and farm supply cooperatives	All respondent cooperatives	Respondents that no longer existed
		<i>Percent</i>	
Northeast	4.30	0.46	
Appalachian	5.24	4.49	1.15
Southeast	2.20	1.96	1.15
Delta States	4.43	4.72	4.60
Corn Belt	23.64	30.65	32.18
Lake States	17.58	22.12	31.03
Northern Plains	27.85	21.66	18.39
Western Plains	3.83	3.57	4.60
Southern Plains	5.93	5.30	1.15
Southwest	1.26	1.38	1.15
Northwest	3.74	3.69	4.60
Total	100.00	100.00	100.00

¹ Northeast: ME, NH, VT, NY, MA, RI, CT, PA, NJ, DE, MD, DC. Appalachian: VA, WV, KY, TN, NC. Southeast: SC, GA, AL, FL. Delta States: MS, LA, AR. Corn Belt: OH, IN, IL, IA, MO. Lake States: MI, WI, MN. Northern Plains: ND, SD, NE, KS. Western Plains: MT, CO, WY. Southern Plains: OK, TX. Southwest: CA, NV, UT, AZ, NM. Northwest: WA, OR, ID, AK, HI.

Table 2—Average farm supplies sold, and farm products marketed, by cooperatives, 1983-88

	1983	1985	1987	1988
<i>Thousand dollars</i>				
Farm supplies sold				
Feed	939	889	874	1,305
Seed	125	157	155	222
Fertilizer	1,058	1,429	1,054	1,564
Agricultural chemicals	520	712	608	879
Petroleum products	1,444	1,664	1,226	1,707
Tires, batteries, and auto accessories	105	114	117	154
Machinery	82	75	59	82
Building materials	84	86	95	132
Containers	2	4	5	1
Food	7	9	9	12
Other	215	260	234	283
Total	4,581	5,399	4,436	6,341
Farm products marketed				
Grain	4,825	4,931	4,243	8,041
Rice	0	12	0	19
Cotton and cotton seed	18	23	36	6
Nuts	1	0	0	0
Dried beans	37	81	70	76
Fresh fruits & vegetables	11	12	25	2
Processed fruits & vegetables	1	0	0	0
Milk & dairy products	87	113	80	234
Poultry	16	2	14	1
Livestock	18	33	3	0
Other	4	2	5	1
Total	5,018	5,209	4,476	8,380
Service income	367	405	565	662
Total sales	9,966	11,013	9,477	15,383

of the cooperatives of this type marketed very few farm products.

Of the 868 cooperatives in the ACF survey, 72 were specialized marketing cooperatives, 423 were mixed marketing cooperatives, 61 were mixed farm supply cooperatives, and 312 were specialized farm supply cooperatives (table 3).

Cooperatives That Ceased To Exist From 1985 to 1990, 91 cooperatives, roughly 10 percent of the cooperatives that responded to the ACF survey, ceased to exist. This decline was about half that experienced by all farmer cooperatives, a likely result of the exclusion of the smallest cooperatives from the study group. Small and specialized farm supply cooperatives were somewhat more likely to be those that ceased to exist than all other sizes and types of cooperative respondents.

Of the ACF survey cooperatives that ceased to exist, 31 went out of business, 41 merged/consolidated with another cooperative, 12 were purchased by a regional cooperative, and 7 were purchased by, or changed to, an investor-owned firm. A small cooperative was more likely to lose its individual identity, as 46 of the cooperatives that ceased to exist were small, 31 were medium, 12 were large, and 2 were super (table 3).

The largest proportion of the cooperatives that ceased to exist were from the Corn Belt (table 1). Cooperatives in the Lake States represented 31 percent of those that ceased to exist. This region also had the highest rate of decline relative to their original percentage of all respondents. Conversely, the Northern Plains had the smallest relative decline. Part of the difference in decline between the Lake States and Northern Plains may be explained by the fact that the former region's respondent composition consisted of 47 percent small cooperatives and the latter had 35 percent small cooperatives. Also, the type of respondents differed greatly, with 51 percent of the Lake States' respondents specialized farm supply cooperatives while 65 percent of the Northern Plains respondents had more diversified sales in that they were mixed marketing cooperatives.

A major reason for cooperatives ceasing to exist may be seen by examining the health of agri-

culture in areas served by these cooperatives. A comparison of growth in county farm production receipts with statewide receipts from 1982 to 1987 showed that 31 of the cooperatives that ceased to exist were located in counties that had substantially lower growth than the States in which they were located. In these counties, growth rates were between 5 and 10 percentage points less than statewide averages for 15 cooperatives and more than 10 percentage points less for 16 of the cooperatives that ceased to exist. Lower farm receipts translated rather directly into lowered purchases of inputs at local cooperatives.

Ten of the 91 cooperatives that ceased to exist were located close to medium-sized cities. Urbanization, with its accompanying changes in economic, social, and physical environments, may have lowered the membership base of these cooperatives or altered it from full-time farmers to part-time "hobby farmers" with a subsequent loss of sales volume.

LOCAL COOPERATIVE SALES PROFILE

Of the 868 respondent cooperatives, detailed sales information from the ACS Annual Survey was available for 664 cooperatives in 1983; 427 cooperatives in 1985; 543 cooperatives in 1987; and 259 cooperatives in 1988 (table 4).

In 1985 the typical ACF survey cooperative respondent had farm supply sales of \$5.4 million and marketed \$5.2 million of farm products (table 2). Total sales of \$11 million in 1985 had grown to \$15.4 million in 1988. Throughout this time, fertilizer was the second largest sales volume item, trailing only petroleum in importance.

From 1983 to 1988, agricultural chemical sales for respondents grew at 12 percent a year (table 5). This compared favorably with the 3 percent annual inflation rate in agricultural chemical prices during the 1980's.

Fertilizer sales grew by more than 5 percent a year from 1983 to 1988. This growth was in spite of the fact that fertilizer prices were stagnant in the 1980's and that the physical volume of fertilizer used for farm production fell about 1 percent.

Table 3—Cooperative respondents, by region, type, and size, 1983 to 1988

Region and cooperative size	All respondents	Specialized Marketing	Mixed Marketing	Mixed Farm Supplies	Specialized Farm Supplies
Northeast					
Small	1	0	0	0	1
Medium	2	0	0	0	2
Large	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>
Total	4	0	0	0	4
Appalachian					
Small	22	0	1	1	20
Medium	13	0	0	0	13
Large	<u>4</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>4</u>
Total	39	0	1	1	37
Southeast					
Small	10	0	0	1	9
Medium	4	0	3	1	0
Large	<u>3</u>	<u>0</u>	<u>2</u>	<u>0</u>	<u>1</u>
Total	17	0	5	2	10
Delta States					
Small	33	0	7	2	24
Medium	7	0	3	1	3
Super	<u>1</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	41	1	10	3	27
Corn Belt					
Small	36	0	22	5	9
Medium	95	8	59	14	14
Large	90	17	58	6	9
Super	<u>45</u>	<u>7</u>	<u>37</u>	<u>1</u>	<u>0</u>
Total	266	32	176	26	32
Lake States					
Small	94	0	20	8	66
Medium	70	7	21	13	29
Large	20	10	7	2	1
Super	<u>8</u>	<u>2</u>	<u>6</u>	<u>0</u>	<u>0</u>
Total	192	19	54	23	96
Northern Plains					
Small	63	0	24	1	38
Medium	60	6	46	2	6
Large	47	5	40	0	2
Super	<u>18</u>	<u>5</u>	<u>13</u>	<u>0</u>	<u>0</u>
Total	188	16	123	3	46
Western Plains					
Small	17	0	1	0	16
Medium	8	1	2	1	4
Large	5	0	4	0	1
Super	<u>1</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>
Total	31	1	7	2	21

continued

Table 3—Cooperative respondents, by region, type, and size, 1983 to 1988—Continued

Region and cooperative size	All respondents	Specialized Marketing	Mixed Marketing	Mixed Farm Supplies	Specialized Farm Supplies
Southern Plains					
Small	17	0	11	0	6
Medium	22	1	18	0	3
Large	5	1	4	0	0
Super	<u>2</u>	<u>0</u>	<u>2</u>	<u>0</u>	<u>0</u>
Total	46	2	35	0	9
Southwest					
Small	8	0	4	0	4
Medium	<u>4</u>	<u>0</u>	<u>2</u>	<u>0</u>	<u>2</u>
Total	12	0	6	0	6
Northwest					
Small	14	0	0	0	14
Medium	8	0	1	0	7
Large	7	1	2	1	3
Super	<u>3</u>	<u>0</u>	<u>3</u>	<u>0</u>	<u>0</u>
Total	32	1	6	1	24
All respondents					
Small	315	0	90	18	207
Medium	293	23	155	32	83
Large	182	34	117	9	22
Super	<u>78</u>	<u>15</u>	<u>61</u>	<u>2</u>	<u>0</u>
Total	868	72	423	61	312
Cooperatives that ceased to exist					
Small	46	0	10	6	30
Medium	31	3	16	5	7
Large	12	4	6	0	2
Super	<u>2</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	91	9	32	11	39
Cooperative growth through merger/ acquisition					
Small	9	0	1	0	8
Medium	18	2	10	3	3
Large	12	2	9	0	1
Super	<u>12</u>	<u>2</u>	<u>10</u>	<u>0</u>	<u>0</u>
Total	51	6	30	3	12

Table 4—Number of cooperatives providing additional sales volume and financial information from ACS annual surveys, 1983-88

Information and type of cooperative	1983	1985	1987	1988
<i>Number of cooperative respondents</i>				
Sales volume information				
Specialized marketing	58	38	43	27
Mixed marketing	321	199	284	142
Mixed farm supply	41	30	31	14
Specialized farm supply	<u>244</u>	<u>160</u>	<u>185</u>	<u>76</u>
Total, all respondents	664	427	543	259
Cooperatives that ceased to exist	60	23	13	5
Cooperative growth through merger/acquisition	<u>45</u>	<u>34</u>	<u>37</u>	<u>22</u>
Total	105	57	50	27
Financial information				
Specialized marketing	64	45	60	41
Mixed marketing	360	237	344	245
Mixed farm supply	49	37	37	19
Specialized farm supply	<u>284</u>	<u>197</u>	<u>237</u>	<u>155</u>
Total, all respondents	757	516	678	460
Cooperatives that ceased to exist	68	24	16	5
Cooperative growth through merger/acquisition	<u>47</u>	<u>38</u>	<u>42</u>	<u>35</u>
Total	115	62	58	40

Table 5—Annual sales growth for agricultural chemicals and fertilizer, all respondent cooperatives, 1983-88

Type of cooperative	Agricultural chemicals	Fertilizer
	<i>Percent</i>	
Specialized marketing	7.3	4.6
Mixed marketing	12.3	5.9
Mixed farm supply	12.8	5.8
Specialized farm supply	13.0	4.8
Average	12.1	5.4
Cooperatives that ceased to exist	5.6	(.3)
Cooperative growth through merger/acquisition	16.1	4.5

Specialized Marketing Cooperatives

Specialized marketing cooperatives had substantially higher marketing sales volume than the marketing and farm supply cooperatives as a whole (table 6). There were 58, 38, 43, and 27 specialized marketing cooperatives, respectively, in 1983, 1985, 1987, and 1988. Grain (mainly corn, wheat, and soybeans) sales dominated the business operations of these cooperatives. On average, specialized marketing cooperatives marketed \$15.4 million in farm products in 1985, while selling \$2.8 million in farm supplies. In contrast to the profile of all respondent cooperatives, fertilizer, not petroleum products, was the number 1 farm supply sold by specialized marketing cooperatives. Service income, which included revenue from grain hauling and agricultural chemical and fertilizer application fees, was only marginally higher than that for all cooperatives.

Mixed Marketing Cooperative Sales

Mixed marketing cooperatives derived between 50 and 75 percent of their sales volume from farm product marketings. There were 321, 199, 284, and 142 cooperative respondents of this type, respectively, in 1983, 1985, 1987, and 1988 (table 7). In all survey years, there were more of this type of cooperative than any other. The most important farm supplies sold for these cooperatives were petroleum products, fertilizer, and feed. On average, mixed marketing cooperatives had the highest proportion of agricultural chemical sales, representing almost 14 percent of total supply sales.

Mixed marketing cooperatives' sales of agricultural chemicals grew at an average 12.3 percent a year between 1983 and 1988 (table 5). This growth rate was just 0.7 percentage points less than that achieved by specialized farm supply cooperatives. Mixed marketing cooperatives had the highest fertilizer sales growth rate of all respondents at 5.9 percent.

Mixed Farm Supply Cooperatives

Mixed farm supply cooperatives had sales of farm supplies representing 75 to 90 percent of their total sales volume. There were 41, 30, 31, and 14 of these respondents, respectively, in the 4 years covered by this study. Cooperatives in this category had their largest volume of sales in petroleum products, feed, and fertilizer (table 8). Of all types of cooperatives, the mixed farm supply group had the highest average sales of each of the major farm supply categories and of farm supplies in total.

Sales of agricultural chemicals by these cooperatives grew by 12.8 percent a year from 1983 to 1987 (table 5). This growth was greater than the annual rate of increase in product prices by almost 9 percentage points. Fertilizer sales also grew, but at a lower rate of 5.8 percent.

Specialized Farm Supply Cooperatives

Specialized farm supply cooperatives derived more than 90 percent of their total sales volume

Table 6—Average farm supplies sold and farm products marketed, specialized marketing cooperatives, 1983-88

	1983	1985	1987	1988
<i>Thousand dollars</i>				
Farm supplies sold				
Feed	578	463	519	846
Seed	129	116	93	146
Fertilizer	792	1,146	788	1,215
Agricultural chemicals	479	595	531	814
Petroleum products	419	390	467	418
Tires, batteries, & auto accessories	31	33	27	35
Machinery	2	8	5	13
Building materials	7	8	13	17
Food	4	5	0	0
Other	44	45	62	75
	<hr/>	<hr/>	<hr/>	<hr/>
Total	2,485	2,809	2,505	3,579
Farm products marketed				
Grain	13,946	14,323	12,119	17,914
Cotton and cotton seed	154	99	370	0
Dried beans	3	5	1	37
Milk and dairy products	604	1,027	733	1,830
Other	0	0	7	12
	<hr/>	<hr/>	<hr/>	<hr/>
Total	14,707	15,454	13,230	19,793
Service income				
	632	580	945	834
	<hr/>	<hr/>	<hr/>	<hr/>
Total sales	17,824	18,843	16,680	24,206

Table 7—Average farm supplies sold and farm products marketed, mixed marketing cooperatives, 1983-88

	1983	1985	1987	1988
<i>Thousand dollars</i>				
Farm supplies sold				
Feed	1,083	1,041	965	1,384
Seed	132	195	172	240
Fertilizer	1,095	1,628	1,095	1,803
Agricultural chemicals	542	811	623	1,015
Petroleum products	1,360	1,700	1,222	1,910
Tires, batteries, & auto accessories	96	106	111	149
Machinery	77	85	46	54
Building materials	114	108	132	140
Containers	1	1	1	2
Food	2	6	3	10
Other	180	197	185	211
Total	4,682	5,878	4,555	6,918
Farm products marketed				
Grain	7,282	7,651	6,126	11,123
Rice	0	25	0	34
Cotton and cotton seed	8	30	13	8
Nuts	3	1	1	0
Dried beans	70	157	124	108
Fresh fruits and vegetables	22	26	47	4
Processed fruits and vegetables	2	0	0	0
Milk and dairy products	71	46	42	79
Poultry	33	4	26	2
Livestock	31	71	6	0
Other	5	1	9	0
Total	7,527	8,012	6,394	11,358
Service income	543	630	823	944
Total sales	12,752	14,520	11,772	19,220

Table 8—Average farm supplies sold and farm products marketed, mixed farm supply cooperatives, 1983-88

	1983	1985	1987	1988
<i>Dollars in thousands</i>				
Farm supplies sold				
Feed	1,635	1,310	1,677	2,741
Seed	146	172	189	489
Fertilizer	1,247	1,398	1,182	1,910
Agricultural chemicals	532	688	621	972
Petroleum products	2,475	2,900	1,991	3,136
Tires, batteries, & auto accessories	144	191	151	296
Machinery	133	21	57	114
Building materials	105	107	82	244
Containers	6	38	54	1
Food	64	56	72	74
Other	395	371	389	667
	<hr/>	<hr/>	<hr/>	<hr/>
Total	6,882	7,252	6,465	10,644
Farm products marketed				
Grain	1,218	1,066	1,222	1,252
Cotton and cotton seed	0	0	0	14
Nuts	0	2	0	0
Dried beans	38	101	86	230
Livestock	39	0	0	0
Other	29	29	0	0
	<hr/>	<hr/>	<hr/>	<hr/>
Total	1,324	1,198	1,308	1,496
Service income	315	319	378	403
	<hr/>	<hr/>	<hr/>	<hr/>
Total sales	8,521	8,769	8,151	12,543

from farm supply sales. There were 244, 160, 185, and 76 respondent cooperatives of this type, respectively, in 1983, 1985, 1987, and 1988 (table 9). The largest volume products sold by this group of cooperatives were petroleum products and fertilizer. On average, these cooperatives had the lowest proportion of their total revenues derived from service income of all respondent categories.

Specialized farm supply cooperatives achieved a growth rate in sales of agricultural chemicals of 13 percent a year from 1983 to 1988 (table 5). This was the highest rate of growth for any type of respondent. Fertilizer sales grew by a relatively low 4.8 percent annual rate.

Sales by Cooperatives Experiencing Major Structural Change

Of the original 868 cooperative respondents to the ACF survey, 142 cooperatives experienced major structural change. These 142 cooperatives either merged with another cooperative, were purchased by an investor-owned firm, or went out of business between 1985 and 1990. Although the information from these cooperatives was analyzed earlier, in this section it is split into two groupings for further analysis: 1) cooperatives that ceased to exist; or 2) cooperatives that grew through merger/acquisition.

Table 9—Average farm supplies sold and farm products marketed, specialized farm supply cooperatives, 1983-88

	1983	1985	1987	1988
<i>Thousand dollars</i>				
Farm supplies sold				
Feed	719	721	683	1,054
Seed	111	117	139	167
Fertilizer	1,041	1,254	1,031	1,178
Agricultural chemicals	500	621	600	632
Petroleum products	1,626	1,690	1,279	1,522
Tires, batteries, & auto accessories	127	129	141	178
Machinery	98	88	91	152
Building materials	60	73	60	137
Containers	2	2	4	1
Food	5	5	11	8
Other	<u>272</u>	<u>370</u>	<u>322</u>	<u>421</u>
Total	4,561	5,070	4,361	5,450
Farm products marketed				
Grain	<u>31</u>	<u>42</u>	<u>29</u>	<u>26</u>
Total	31	42	29	26
Service income	<u>81</u>	<u>100</u>	<u>112</u>	<u>123</u>
Total sales	4,673	5,212	4,502	5,599

Cooperatives That Ceased To Exist

Cooperatives that ceased to exist included ones that merged with or were acquired by other cooperatives, were acquired by investor-owned firms, or went out of business for any reason. Of the 868 ACF survey respondents, 91 no longer existed in 1988. These 91 cooperatives were most often small and had a common dilemma—before going out of business they usually had negative net incomes and erosion of owner equity.

Forty-two cooperatives merged with or were acquired by another cooperative. These cooperatives were most often significantly smaller than the cooperative that they merged with or were acquired by. After the merger or acquisition, the larger cooperative's name was most often retained, and these 42 cooperatives no longer existed. Investor-owned firms acquired or merged with seven of the respondent cooperatives. The remaining 42 cooperatives that no longer existed went out of business.

Additional information from the annual ACS surveys was used for further analysis of the cooperatives that ceased to exist. Since these cooperatives disappeared throughout the time period of this study, more of these cooperatives responded to the 1983 ACS survey than the 1988 survey. In other words, additional information was known about 60 respondents in 1983, 23 in 1985, 13 in 1987, and only 5 in 1988.

Farm supplies sales were on average larger for these cooperatives than farm product marketing as the majority (50) were either specialized or mixed farm supply cooperatives (table 10). Petroleum products and fertilizer were the major farm supplies sold with agricultural chemicals and feed also important. Total sales of more than \$6 million were about two-thirds of the \$10 million average of all cooperatives in 1983.

Cooperatives that ceased to exist achieved growth in agricultural chemical sales of 5.6 percent per year (table 5). This was about half of the 12.1 percent growth rate for all respondents. A fertilizer sales decline of 0.3 percent a year for these cooperatives from 1983 to 1988 was in direct contrast to the 5.4 percent annual growth rate for all cooperatives.

Cooperatives Growing Through Merger or Acquisition

Fifty-one respondent cooperatives experienced significant growth from mergers or acquisitions. Of these, 31 occurred between cooperatives that were both ACF survey respondents. One was among three ACF survey respondents. Additional sales information from the ACS annual survey was found for 45, 34, 37 and 22 of these cooperatives, respectively, in 1983, 1985, 1987, and 1988.

Although the sample size was rather small, cooperatives that grew through merger/acquisition appeared to be some of the largest ACF survey respondents, averaging more than \$18.2 million in total sales in 1985 (table 11). Grain marketed for patrons averaged \$11 million in 1985, about 80 percent of the grain sales volume of specialized marketing cooperatives.

Farm supply sales averaged \$6.2 million in 1985, about 80 percent of that achieved by mixed farm supply cooperatives. Cooperatives that merged or acquired other cooperatives had their largest supply sales in petroleum products in 1988, followed closely by feed, fertilizer, and agricultural chemicals. They also had relatively high service income.

For cooperatives in this category, the rate of growth in agricultural chemical sales from 1983 to 1988 was 16.1 percent a year (table 5), 4 percentage points higher than the average for all cooperatives. Sales growth for fertilizer averaged about 4.5 percent, about 1 percentage point lower than the average for all cooperatives over the same period.

LOCAL COOPERATIVE FINANCIAL PROFILE

The financial profile of all respondents was based on 757, 516, 678, and 460 cooperatives for the years 1983, 1985, 1987, and 1988, respectively. The assets of the average survey cooperative ranged from just less than \$4 million in 1983 to almost \$5 million in 1988 (table 12). The members of these cooperatives held an average of almost \$3 million in owner equity in 1988. The net value of physical assets was more than \$1.5 million in 1988. Long-term liabilities fell by more than \$200,000 between 1983 and 1988 to an average \$.3 million.

Table 10—Average farm supplies sold and farm products marketed, all respondent cooperatives that ceased to exist, 1983-88

	1983	1985	1987	1988
<i>Thousand dollars</i>				
Farm supplies sold				
Feed	614	478	420	752
Seed	83	64	112	116
Fertilizer	792	1,501	993	1,016
Agricultural chemicals	426	707	683	507
Petroleum products	1,364	1,122	1,258	605
Tires, batteries, & auto accessories	77	57	41	4
Machinery	32	25	32	96
Building materials	20	22	5	4
Containers	0	0	7	0
Food	9	26	0	43
Other	101	148	86	119
	<hr/>	<hr/>	<hr/>	<hr/>
Total	3,518	4,150	3,637	3,262
Farm products marketed				
Grain	2,915	2,305	2,557	5,890
Milk and dairy products	18	0	0	0
Other	0	1	0	0
	<hr/>	<hr/>	<hr/>	<hr/>
Total	2,933	2,306	2,557	5,890
Service income				
	252	200	305	450
	<hr/>	<hr/>	<hr/>	<hr/>
Total sales	6,703	6,656	6,499	9,602

Table 11—Average farm supplies sold and farm products marketed, all respondent cooperatives that grew through merger/acquisition, 1983-88

	1983	1985	1987	1988
<i>Thousand dollars</i>				
Farm supplies sold				
Feed	1,398	1,388	1,357	2,208
Seed	185	215	254	377
Fertilizer	1,267	1,532	1,280	1,966
Agricultural chemicals	579	705	701	1,025
Petroleum products	1,602	1,723	1,701	2,357
Tires, batteries, & auto accessories	136	148	222	298
Machinery	80	13	6	19
Building materials	84	133	136	261
Containers	0	28	46	0
Food	0	2	21	4
Other	263	324	233	325
	<hr/>	<hr/>	<hr/>	<hr/>
Total	5,594	6,211	5,957	8,840
Farm products marketed				
Grain	9,783	11,032	9,288	16,140
Cotton and cotton seed	0	0	208	0
Dried beans	200	374	409	513
	<hr/>	<hr/>	<hr/>	<hr/>
Total	9,983	11,406	9,905	16,653
Service income				
	665	628	1,177	1,286
	<hr/>	<hr/>	<hr/>	<hr/>
Total sales	16,242	18,245	17,039	26,779

Table 12—Abbreviated balance sheet for all cooperative respondents, 1983-88

	1983	1985	1987	1988
<i>Thousand dollars</i>				
Assets				
Current assets	1,926	1,925	1,815	2,317
Property, plant, & equipment(net) ¹	1,234	1,294	1,222	1,543
Other assets	775	908	861	1,060
Total assets	3,935	4,127	3,898	4,920
Liabilities and owner equity				
Current liabilities	1,195	1,101	1,092	1,767
Long-term liabilities ²	550	569	339	310
Total liabilities	1,745	1,671	1,431	2,076
Owner equity	2,190	2,456	2,467	2,844
Total liabilities and owner equity	3,935	4,127	3,898	4,920

¹ Property, plant, and equipment estimated in 1983, 1985, and 1988 using 1987 data.

² Long-term liabilities information incomplete for 1983, 1985, and 1988. Data adjusted.

Most respondent cooperatives were owner members of one or more regional cooperatives. Their average investment in regional cooperatives ranged from \$400,000 for small cooperatives, \$600,000 for medium-sized cooperatives, \$900,000 for large cooperatives, and \$1.9 million for super cooperatives. Investments in regional cooperatives, resulting primarily from patronage with regionals, were usually revolved back to local cooperatives on a set schedule. Most respondent cooperatives also invested in CoBank, the bank for cooperatives. An average investment of \$167,000 in Cobank was made by 71 percent of these cooperatives. Investment in Cobank is usually required in order to obtain funds from the bank in proportion to funds borrowed.

In 1988, the average respondent cooperative generated net income of \$327,000 on sales of \$12.2 million (table 13). For each \$1 of sales, these cooperatives made 2.7 cents in 1988, a 1-cent improve-

ment over 1983. Employee expenses accounted for 5 cents of every \$1 of sales. During this time, long-term debt as a percentage of assets fell dramatically, from nearly 14 percent in 1983 to just over 6 percent in 1988.

Specialized Marketing Cooperatives

Financial information on 64, 45, 60, and 41 cooperatives for 1983 through 1988, respectively, is presented for specialized marketing cooperatives in table 14. These cooperatives had considerably more current assets, physical assets, liabilities, and owner equity than the average respondent. A large portion of the current assets of specialized marketing cooperatives was tied up in inventories of products they marketed for their patrons. Storage facilities for these products likely accounted for the relatively high property, plant, and equipment values for this group which at \$2.8 million in 1988

Table 13—Financial information for an average cooperative respondent, 1983-88

	1983	1985	1987	1988
<i>Thousand dollars</i>				
Total sales	9,899	10,471	9,106	12,211
Employee expenses ¹	496	584	529	608
Net income	165	133	225	327
<i>Cents</i>				
Net income per dollar of sales	1.7	1.3	2.5	2.7
Employee expenses per dollar of sales ¹	5.0	5.6	5.8	5.0
<i>Percent</i>				
Long-term debt as a percentage of total assets ¹	13.98	13.80	8.69	6.29
Total debt as a percentage of total assets	44.34	40.48	36.70	42.20

¹ Employee expenses information incomplete for all years and long-term liabilities information incomplete for 1983, 1985, and 1988. Data adjusted.

Table 14—Abbreviated balance sheet for an average specialized marketing cooperative, 1983-88

	1983	1985	1987	1988
<i>Thousand dollars</i>				
Assets				
Current assets	2,649	2,829	2,590	3,515
Property, plant, & equipment(net) ¹	2,082	2,354	2,183	2,842
Other assets	886	1,167	1,116	1,310
Total assets	5,617	6,350	5,888	7,667
Liabilities and owner equity				
Current liabilities	1,705	1,808	1,853	3,377
Long-term liabilities ²	1,114	1,232	826	767
Total liabilities	2,818	3,040	2,679	4,143
Owner equity	2,799	3,311	3,209	3,524
Total liabilities and owner equity	5,617	6,350	5,888	7,667

¹ Property, plant, and equipment estimated in 1983, 1985, and 1988 using 1987 data.

² Long-term liabilities information incomplete for 1983, 1985, and 1988. Data adjusted.

averaged almost \$1 million more than other types of cooperatives.

Specialized marketing cooperatives had the largest average sales volume and the lowest employee costs at 2.8 cents per \$1 of sales in 1988 (table 15). Employee costs remained low for these cooperatives because of the nature of their sales. Specialized marketing cooperatives usually operated on a very small margin, only 1.9 cents (net) on sales of all products sold in 1988. They took possession of the products, but generally added little value to it. Therefore, these cooperatives generated their net income through a low-expense, high-volume operation.

Long-term debt fell steadily between 1983 and 1988, from 19.8 percent of total assets to 10 percent. Specialized marketing cooperatives, however, still had significantly higher proportions of their total asset base represented by long-term debt than did the average respondent. Over the same period, total debt as a percentage of assets remained near 50 percent, a result of the short-term financing of the upward-trending inventories (current assets).

Mixed Marketing Cooperatives

Financial information was available for 360, 237, 344, and 245 mixed marketing respondents in 1983, 1985, 1987, and 1988, respectively. This group trailed only specialized marketing cooperatives in plant, property, and equipment, total assets, total liabilities, and owner equity (table 16).

Income per dollar sales for mixed marketing cooperatives averaged about the same as for all respondents, though somewhat higher than that of specialized marketing cooperatives. Total employee expenses were much greater than those in both types of farm supply cooperatives because mixed marketing cooperatives were generally much larger (table 17). Employee expense per dollar sales averaged about 0.5 cent lower for this group, however, than for the average respondent cooperative.

Long-term debt as a percentage of total assets fell from 14.8 percent in 1983 to 6.5 percent in 1988, 3 percentage points lower in 1988 than that of specialized marketing cooperatives. As with specialized marketing cooperatives, this group had a higher than average percentage of assets supported by total debt, compared to the average survey

Table 15—Financial information for an average specialized marketing cooperative, 1983-88

	1983	1985	1987	1988
<i>Thousand dollars</i>				
Total sales	17,881	17,842	14,920	20,550
Employee expenses ¹	517	582	472	568
Net income	245	201	357	400
<i>Cents</i>				
Net income per dollar of sales	1.4	1.1	2.4	1.9
Employee expenses per dollar of sales ¹	2.9	3.3	3.2	2.8
<i>Percent</i>				
Long-term debt as a percentage of total assets ¹	19.82	19.40	14.03	10.00
Total debt as a percentage of total assets	50.17	47.87	45.50	54.04

¹ Employee expenses information incomplete for all years and long-term liabilities information incomplete for 1983, 1985, and 1988. Data adjusted.

Table 16—Abbreviated balance sheet for an average mixed marketing cooperative, 1983-88

	1983	1985	1987	1988
<i>Thousand dollars</i>				
Assets				
Current assets	2,200	2,233	2,084	2,769
Property, plant, & equipment(net) ¹	1,624	1,763	1,561	1,989
Other assets	935	1,172	930	1,071
Total assets	4,759	5,168	4,574	5,829
Liabilities and owner equity				
Current liabilities	1,466	1,423	1,354	2,218
Long-term liabilities ²	703	761	405	381
Total liabilities	2,169	2,184	1,759	2,599
Owner equity	2,590	2,984	2,815	3,229
Total liabilities and owner equity	4,759	5,168	4,574	5,829

¹ Property, plant, and equipment estimated in 1983, 1985, and 1988 using 1987 data.

² Long-term liabilities information incomplete for 1983, 1985, and 1988. Data adjusted.

Table 17—Financial information for an average mixed marketing cooperative, 1983-88

	1983	1985	1987	1988
<i>Thousand dollars</i>				
Total sales	12,613	13,891	11,266	15,320
Employee expenses ¹	536	687	593	676
Net income	219	149	273	382
<i>Cents</i>				
Net income per dollar of sales	1.7	1.1	2.4	2.5
Employee expenses per dollar of sales ¹	4.3	4.9	5.3	4.4
<i>Percent</i>				
Long-term debt as a percentage of total assets ¹	14.77	14.72	8.86	6.54
Total debt as a percentage of total assets	45.58	42.26	38.46	44.59

¹ Employee expenses information incomplete for all years and long-term liabilities information incomplete for 1983, 1985, and 1988. Data adjusted.

respondent. This is likely a result of the necessity to finance grain inventories.

Mixed Farm Supply Cooperative

Financial data was available for 49, 37, 37, and 19 mixed farm supply cooperative respondents in 1983, 1985, 1987, and 1988, respectively. For this group, owner equity grew from \$2 million in 1983 to \$3 million in 1988 (table 18). These cooperatives marketed a small amount of their patrons' products so that plant, property, and equipment, which averaged more than \$1 million, would most typically be in the form of storage facilities for farm supplies, application equipment, and maybe a feed mill.

Mixed farm supply cooperatives had high employee costs; almost 8 cents of every \$1 of sales was needed for employee expenses (table 19). Products sold generated 3.4 cents of net income per \$1 of sales in 1988, a dramatic increase from the less than 1 cent per dollar levels achieved in the first half of the decade. Long-term debt as a percent

of assets fell from 14.5 percentage in 1983 to 3.5 percent in 1988.

Specialized Farm Supply Cooperatives

Specialized farm supply cooperatives had the lowest average dollar values of assets, liabilities, and owner equities of all respondent groups (table 20). Assets held fairly steady throughout this period, while liabilities fell, largely a function of cutting long-term debt. Thus an average net increase in owner equity of nearly \$500,000 was achieved by these cooperatives in 1988.

As with mixed farm supply cooperatives, net income per dollar sales rose considerably, from 1.9 cents in 1983 to 4.1 cents in 1988 (table 21). Sales for specialized farm supply cooperatives tended to be highly concentrated in labor-intensive, higher margin products like petroleum, fertilizers, and feeds. This resulted in the highest average employee expenses of any group, at 9.2 cents per dollar of sales in 1988.

Table 18—Abbreviated balance sheet for an average mixed farm supply cooperative, 1983-88

	1983	1985	1987	1988
<i>Thousand dollars</i>				
Assets				
Current assets	2,027	1,915	1,680	2,141
Property, plant, & equipment(net) ¹	1,048	1,010	989	1,434
Other assets	625	641	823	1,488
Total assets	3,700	3,566	3,492	5,063
Liabilities and owner equity				
Current liabilities	1,160	981	839	1,836
Long-term liabilities ²	537	544	323	177
Total liabilities	1,698	1,525	1,162	2,013
Owner equity	2,002	2,042	2,330	3,050
Total liabilities and owner equity	3,700	3,566	3,492	5,063

¹ Property, plant, and equipment estimated in 1983, 1985, and 1988 using 1987 data.

² Long-term liabilities information incomplete for 1983, 1985, and 1988. Data adjusted.

Table 19—Financial information for an average mixed farm supply cooperative, 1983-88

	1983	1985	1987	1988
<i>Thousand dollars</i>				
Total sales	8,741	8,722	8,020	11,436
Employee expenses ¹	688	718	705	877
Net income	80	82	186	385
<i>Cents</i>				
Net income per dollar of sales	.9	.9	2.3	3.4
Employee expenses per dollar of sales ¹	7.9	8.2	8.8	7.7
<i>Percent</i>				
Long-term debt as a percentage of total assets ¹	14.52	15.25	9.25	3.49
Total debt as a percentage of total assets	45.88	42.75	33.27	39.76

¹ Employee expenses information incomplete for all years and long-term liabilities information incomplete for 1983, 1985, and 1988. Data adjusted.

Table 20—Abbreviated balance sheet for an average specialized farm supply cooperative, 1983-88

	1983	1985	1987	1988
<i>Thousand dollars</i>				
Assets				
Current assets	1,318	1,268	1,249	1,398
Property, plant, & equipment(net) ¹	540	523	524	580
Other assets	695	680	703	761
Total assets	2,553	2,471	2,477	2,739
Liabilities and owner equity				
Current liabilities	765	599	559	616
Long-term liabilities ²	208	168	122	94
Total liabilities	974	767	680	710
Owner equity	1,579	1,704	1,797	2,029
Total liabilities and owner equity	2,553	2,471	2,477	2,739

¹ Property, plant, and equipment estimated in 1983, 1985, and 1988 using 1987 data.

² Long-term liabilities information incomplete for 1983, 1985, and 1988. Data adjusted.

Table 21—Financial Information for an average specialized farm supply cooperative, 1983-88

	1983	1985	1987	1988
<i>Thousand dollars</i>				
Total sales	4,859	5,001	4,669	5,187
Employee expenses ¹	389	422	421	479
Net income	95	107	128	215
<i>Cents</i>				
Net income per dollar of sales	1.9	2.1	2.7	4.1
Employee expenses per dollar of sales ¹	8.0	8.4	9.0	9.2
<i>Percent</i>				
Long-term debt as a percentage of total assets ¹	8.16	6.79	4.92	3.42
Total debt as a percentage of total assets	38.15	31.05	27.47	25.93

¹ Employee expenses information incomplete for all years and long-term liabilities information incomplete for 1983, 1985, and 1988. Data adjusted.

An important factor for profitability in these cooperatives was their low use of long-term and total debt to finance operations, thus lowering interest expenses. Part of the reason for the relatively low use of debt was that these cooperatives did not have to finance large product inventories associated with marketing operations.

Cooperatives That Ceased To Exist

An examination of the financial performance and condition of cooperatives that ceased to exist during the 1983 to 1990 period showed some marked differences between cooperatives in this group and all other respondent cooperatives (tables 22 and 23). Total sales of cooperatives that went out of existence averaged only 73 percent of these achieved by other respondent cooperatives. Performance in terms of net income per dollar sales was considerably lower for this group of cooperatives, with losses in 1983 and 1985, and marginal performance of about 1 cent of net income per dollar of sales in 1987 and 1988. Their average performance in 1987 and 1988 looked better than in earlier

years only because the weakest members of that category were already out of business.

The differences between their group and all other respondent cooperatives were easily seen in the relative capital structures of the two groups. In terms of total assets, cooperatives that ceased to exist averaged only 60 percent of those controlled by all respondent cooperatives. The heavy dependence of these cooperatives on debt financing clearly played a role in the exit of these organizations.

Cooperatives That Grew Through Merger/Acquisition

Cooperatives that grew through merger/acquisition had significantly more assets than the average cooperative (table 24). In 1988 they had \$2.7 in million plant, property, and equipment, about \$1.5 million more than the average cooperative. The merger with or acquisition of another cooperative apparently was done without the use of large amounts of long-term debt. These cooperatives averaged \$546,000 in long-term debt, only \$236,000 more than all respondents. At the owner equity than the average cooperative.

Table 22—Abbreviated balance sheet for respondent cooperatives that ceased to exist, 1983-88

	1983	1985	1987	1988
<i>Thousand dollars</i>				
Assets				
Current assets	1,384	877	1,253	1,243
Property, plant, & equipment(net) ¹	1,035	890	971	1,085
Other assets	678	897	681	919
Total assets	3,097	2,664	2,904	3,247
Liabilities and owner equity				
Current liabilities	1,252	1,015	996	1,328
Long-term liabilities ²	518	550	462	147
Total liabilities	1,770	1,565	1,458	1,476
Owner equity	1,326	1,099	1,446	1,771
Total liabilities and owner equity	3,097	2,664	2,904	3,247

¹ Property, plant, and equipment estimated in 1983, 1985, and 1988 using 1987 data.

² Long-term liabilities information incomplete for 1983, 1985, and 1988. Data adjusted.

Table 23—Financial information for respondent cooperatives that ceased to exist, 1983-88

	1983	1985	1987	1988
<i>Thousand dollars</i>				
Total sales	7,146	6,351	7,601	9,601
Employee expenses ¹	416	372	386	333
Net income (loss)	(7)	(134)	80	113
<i>Cents</i>				
Net income per dollar of sales	(.1)	(2.1)	1.1	1.2
Employee expenses per dollar of sales ¹	5.8	5.9	5.1	3.5
<i>Percent</i>				
Long-term debt as a percentage of total assets ¹	16.73	20.66	15.90	4.54
Total debt as a percentage of total assets	57.16	58.76	50.20	45.45

¹ Employee expenses information incomplete for all years and long-term liabilities information incomplete for 1983, 1985, and 1988. Data adjusted.

Table 24—Abbreviated balance sheet for respondent cooperatives that grew through merger/acquisition, 1983-88

	1983	1985	1987	1988
<i>Thousand dollars</i>				
Assets				
Current assets	3,158	3,256	3,208	3,715
Property, plant, & equipment. (net) ¹	2,141	2,276	2,287	2,783
Other assets	880	1,035	1,104	1,533
Total assets	6,179	6,567	6,599	8,031
Liabilities and owner equity				
Current liabilities	2,080	1,817	1,908	2,840
Long-term liabilities ²	696	878	613	546
Total liabilities	2,776	2,696	2,521	3,386
Owner equity	3,403	3,872	4,077	4,645
Total liabilities and owner equity	6,179	6,567	6,599	8,031

¹ Property, plant, and equipment estimated in 1983, 1985, and 1988 using 1987 data.

² Long-term liabilities information incomplete for 1983, 1985, and 1988. Data adjusted.

Net income per dollar of sales, at 2.9 cents in 1988, was about the same as that for all respondent cooperatives (table 25). Employee costs of 4.4 cents per dollar of sales in 1988 were also about the same as those for all cooperatives. Long-term debt as a percentage of total assets was lower in the earlier years, but at 6 percent in 1988 was slightly more than the average of all respondents.

SALES VOLUME ANALYSIS

Respondent cooperative sales of agricultural chemicals grew more than 12 percent a year from 1983 to 1988 (table 5). Fertilizer sales during this same period increased 5.4 percent a year. Further analysis of the agronomy sales of local cooperatives was conducted using a combination of the ACF survey and the annual ACS surveys. Dollar sales volumes of agricultural chemicals and fertilizer for the years 1983 through 1988 as well as information

on cooperative financial condition and structure were used to identify major changes in operations or redeployment of assets.

It was assumed, unless there was a dramatic change in a cooperative's agricultural chemicals or fertilizer revenues or its physical assets, that the cooperative's basic operations remained essentially unchanged over the 1983 to 1988 period. For example, if a cooperative indicated having agronomy application equipment in the ACF survey, it was assumed that this cooperative still offered the same type of application services in 1988.

Agricultural Chemicals

Agricultural chemical revenues were composed of the product sales and revenues from four other services (table 26). Product sales provided 96 percent of total agricultural chemical revenues for the respondent group. Custom application charges

Table 25—Financial information for respondent cooperatives that grew through merger/acquisition, 1983-88

	1983	1985	1987	1988
<i>Thousand dollars</i>				
Total sales	15,963	17,676	15,762	20,919
Employee expenses ¹	647	582	771	921
Net income	411	240	461	604
<i>Cents</i>				
Net income per dollar of sales	2.6	1.4	2.9	2.9
Employee expenses per dollar of sales	4.1	3.3	4.9	4.4
<i>Percent</i>				
Long-term debt as a percentage of total assets ¹	11.26	13.38	9.29	6.80
Total debt as a percentage of total assets	44.92	41.05	38.21	42.16

¹ Employee expenses information incomplete for all years and long-term liabilities information incomplete for 1983, 1985, and 1988. Data adjusted.

Table 26—Percentage and composition of agricultural chemical revenues, by cooperative size and type, 1985

Cooperatives	Total agricultural chemical sales	Percentage of total sales	Sales composition				
			Product sales	Delivery charges	Custom	Advisory	All
					applica- tion charges	service charges	other revenues
Dollars		Percent					
Cooperative size							
Super	65,659,099	17.08	95.64	0.12	4.11	0.05	0.09
Large	82,319,674	21.41	96.30	.07	3.35	.17	.11
Medium	99,903,539	25.98	95.98	.08	3.44	.07	.43
Small	79,816,963	20.76	96.52	.09	2.82	.07	.50
Cooperative type							
Specialized marketing	30,663,391	7.98	97.07	.15	2.78		
Mixed marketing	172,380,025	44.84	95.26	.07	4.32	.04	.32
Mixed farm supply	30,367,008	7.90	95.25	.17	3.85	.41	.31
Specialized farm supply	151,062,280	39.29	96.77	.07	2.87	.07	.22
Total cooperatives that ceased to exist							
	36,346,556	9.45	96.51	.03	3.46		
Total cooperative growth through merger or acquisition							
	20,426,873	5.31	93.11	.05	6.83		.01
All respondents	384,472,704	100.00	96.00	.08	3.59	.08	.25

provided almost 4 percent of revenues. Delivery charges and advisory service charges each provided less than one-tenth of 1 percent.

Mixed marketing cooperatives, which represented more than 44 percent of total sales made by all respondent cooperatives, derived the highest proportion of their total agricultural revenues, 4.3 percent, from application charges. The importance of application charge revenues appeared to increase with the larger size of cooperatives. Cooperatives that grew through merger or acquisition obtained the highest share of their total agricultural chemical revenues from services.

Over the period of this study, 9.5 percent of cooperative sales volume was accounted for by cooperatives that underwent a significant struc-

tural change—either they no longer existed, or they grew through merger/acquisition. Of this 9 percent, 6 percent of the volume was no longer cooperatively owned while 3 percent remained within the cooperative sector having been purchased by or merged with another cooperative.

The U.S. farmer cooperatives system manufactured few of the agricultural chemicals sold by cooperatives at the retail level. Yet regional or interregional cooperatives were the source for more than 75 percent of the agricultural chemicals sold by respondent cooperatives (table 27).

Specialized marketing cooperatives purchased the smallest share of their agricultural chemicals from regional cooperatives, looking to them for only 65 percent of their total agricultural chemical

Table 27—Percentage of cooperative agricultural chemicals sold provided by various product sources, 1985

Cooperative	Regional or interregional cooperatives	Other local cooperatives	Noncooperative wholesalers/distributors	Noncooperative manufacturing companies
<i>Percent (weighted average)</i>				
Cooperative size				
Super	74.41	0.32	23.57	1.71
Large	75.67	.39	22.44	1.50
Medium	79.56	.78	17.87	1.80
Small	76.75	1.15	19.90	2.20
Cooperative type				
Specialized marketing	64.57	.33	34.96	.14
Mixed marketing	75.92	.63	22.06	1.38
Mixed farm supply	87.87	.49	10.29	1.35
Specialized farm supply	75.20	.82	17.60	6.38
Cooperatives that ceased to exist				
Weighted average	68.30	.73	17.76	13.21
Cooperative growth through merger or acquisition				
Weighted average	73.20	.37	21.07	5.36
All respondents	75.76	.67	20.38	3.20

purchases. This group of cooperatives, which are less likely to be members of a farm supply regional cooperative, used a non-cooperative distributor for 35 percent of their chemical purchases far more often than other types of cooperatives.

Cooperatives that ceased to exist acquired an average of 68 percent of their agricultural chemicals from regional cooperatives, much lower than average. They also dealt directly with non-cooperative manufacturing companies for 13 percent of their chemicals, far more than any other group of cooperatives.

Survey respondent cooperatives were asked the percentage of their agricultural chemical sales going to small farms (sales less than \$20,000/year), medium-size farms (\$20,000 to \$200,000/year), and

large farms (greater than \$200,000/year). More than 56 percent of all respondent cooperative agricultural chemical sales were to medium-sized farms (table 28). Small cooperatives had the highest percentage of average sales to small farms at 27 percent. Sales by large cooperatives to large farms were only slightly higher 22 percent than the 20 percent of sales to large farms by all respondents.

Fertilizer

Fertilizer revenues included product sales as well as application charges and revenues from four related services (table 29). The composition of fertilizer sales was similar to agricultural chemicals with more than 96 percent of sales volume from the

Table 28—Percentage of cooperative agricultural chemical sales by farm size, 1985

Cooperatives	Agricultural chemical sales to farms of these sizes		
	Small farms with sales less than \$200,000	Medium farms with sales from \$20,000 to \$200,000	Large farms with sales more than \$200,000
	<i>Percent (weighted average)</i>		
Cooperative size			
Super	20.89	59.59	19.52
Large	20.54	57.48	21.98
Medium	24.65	57.97	17.38
Small	27.11	53.59	19.29
Cooperative type			
Specialized marketing	24.10	58.81	17.09
Mixed marketing	23.04	57.79	19.17
Mixed farm supply	26.31	55.44	18.25
Specialized farm supply	22.69	55.52	21.79
Cooperatives that ceased to exist			
Weighted average	23.10	53.40	23.50
Cooperative growth through merger or acquisition			
Weighted average	21.23	57.95	20.82
All respondents	23.25	56.81	19.94

product. Application charges represented the next largest revenue component at 2.6 percent. The composition of sales revenues among the various local cooperative categories was fairly consistent. While application charges were not as significant a proportion of total revenues with fertilizer as they were for chemicals, mixed marketing cooperatives and those that grew through merger or acquisition tended to have a higher share of their fertilizer revenues derived from application charges. Unlike agricultural chemicals, there seemed to be no clear relationship between size of cooperative and the importance of application charge revenues.

The farmer cooperatives system plays a major role in the manufacture of nitrogen and phosphorus fertilizers. Therefore, it might be expected that

a high proportion of fertilizer sold by respondent cooperatives was provided by regional and interregional cooperatives (table 30). Regional or interregional cooperatives provided 85 percent of respondent cooperative fertilizer volume, compared to 75 percent of agricultural chemical volume.

As was the case for agricultural chemicals, specialized marketing cooperatives acquired the lowest percentage of their fertilizer volume, 75 percent, from regional cooperatives. Medium and small cooperatives obtained the highest percentage of their fertilizer (87 and 89 percent respectively) from regional cooperatives. Cooperatives that ceased to exist acquired 81 percent of their fertilizer volume from regional cooperatives, about 4 percent less than average.

Table 29—Percentage and composition of fertilizer sales by cooperative size and type, 1985

Cooperatives	Total fertilizer sales	Sales composition:						
		Percentage of total sales	Product sales	Mixing & blending charges	Delivery charges	Custom applica- tion charges	Advisory service charges	All other revenues
	<i>Dollars</i>	<i>Percent</i>						
Cooperative size								
Super	127,250,766	16.08	96.50	0.19	0.59	2.42	0.02	0.27
Large	173,303,185	21.90	95.93	.16	.53	2.85	.08	.43
Medium	206,624,040	26.11	96.39	.15	.38	2.86	.05	.17
Small	165,035,684	20.86	97.33	.06	.27	2.20		.14
Cooperative type								
Specialized marketing	53,366,987	6.74	97.84	.02	.15	1.99		.01
Mixed marketing	350,915,565	44.34	95.97	.17	.45	2.94	.10	.37
Mixed farm supply	69,565,110	8.79	97.26	.24	.37	1.91	.02	.20
Specialized farm supply	317,494,084	40.12	96.50	.08	.45	2.58	.03	.36
Total cooperatives that ceased to exist								
	71,971,901	9.09	95.90	.07	.37	2.39	.06	1.21
Total cooperative growth through merger or acquisition								
	47,156,170	5.96	95.74	.10	.37	3.41	.30	.08
All respondents	791,341,746	100.00	96.42	.13	.42	2.64	.06	.34

Table 30—Percentage of cooperative fertilizer sold provided by each source, 1985

Cooperative	Regional or interregional cooperatives	Other local cooperatives	Noncooperative wholesalers/ distributors	Noncooperative manufacturing companies
<i>Percent (weighted average)</i>				
Cooperative size				
Super	84.81	0.07	11.17	3.94
Large	82.68	2.54	11.52	3.26
Medium	87.37	.59	8.07	3.97
Small	89.35	.81	8.44	1.40
Cooperative type				
Specialized marketing	74.77	2.55	20.00	2.67
Mixed marketing	84.26	1.81	9.92	4.01
Mixed farm supply	92.33	.22	5.43	2.02
Specialized farm supply	85.79	.43	7.52	6.27
Cooperatives that ceased to exist				
Weighted average	80.63	1.15	6.40	11.82
Cooperative growth through merger or acquisition				
Weighted average	76.02	2.70	7.99	13.29
All respondents	85.01	1.17	9.20	4.63

Similar to agricultural chemical sales, more than 56 percent of all respondent cooperatives' fertilizer sales were to medium-sized farms (table 31). Small cooperatives had more than 32 percent of their fertilizer sales to small farms.

PRODUCT SELECTION

Each cooperative was asked to indicate from a list of factors how each influenced its decision regarding the type of products it carried. A rating scale of 1 to 5 was used with a 1 meaning "highly influential" and a 5 meaning "not at all influential" (table 32).

Even though most of their agricultural chemical volume was purchased from regional or interregional cooperatives and respondent cooperatives had significant average investment in regional cooperatives—ranging from \$400,000 to \$1,900,000—regional cooperatives were not rated as the most important influence on the types and brands of agricultural chemicals that respondents sold. Respondent cooperatives felt that competitors, both non-cooperative suppliers and other dealers, exerted the most influence on chemical products handled. Farmer patrons were the third most important influencing factor, followed closely by regional cooperative personnel. The final two

Table 31—Percentage of cooperative fertilizer sales, by farm size, 1985

Cooperative	Fertilizer sales to farms of these sizes:		
	Small farms with sales less than \$20,000	Medium farms with sales from \$20,000 to \$200,000	Large farms with sales more than \$200,000
	<i>Percent (weighted average)</i>		
Cooperative size			
Super	19.21	60.73	20.06
Large	18.65	56.81	24.54
Medium	26.91	54.96	18.13
Small	32.93	54.41	12.66
Cooperative type			
Specialized marketing	24.44	60.14	15.41
Mixed marketing	21.85	58.03	20.12
Mixed farm supply	27.08	55.32	17.60
Specialized farm supply	26.64	53.72	19.64
Cooperatives that ceased to exist			
Weighted average	23.51	53.44	23.06
Cooperative growth through merger or acquisition			
Weighted average	22.05	58.03	19.92
All respondents	24.37	56.24	19.39

potential factors, university and extension personnel and publications and trade journals, were significantly less influential.

Indicative of the generic nature of most fertilizer products, none of the proposed factors were judged as being very influential in the selection of fertilizers handled by the cooperatives. This selection would appear to be far more a function of the agronomic requirements of crops grown within a cooperative's market. As in the case of agricultural chemicals, however non-cooperative suppliers and other dealers exerted the most relative influence on product selection. Other suggested sources of influ-

ence were not indicated as being particularly influential (table 33).

Relative importance among the six proposed influencers in influencing product selection was fairly consistent between the different size and type categories. As size increases, cooperatives tended to place a relatively decreasing emphasis on other dealers and suppliers in determining their product selections. This could be a result of the influence of factors not included in the list, or that the cooperatives with size gain an element of leadership within their relevant market. If this hypothesis is true, product selection could be a factor of the cooperatives' own internal assessment.

Table 32—Influences on the types and brands of agricultural chemicals that a cooperative carries, 1985 ¹

Cooperative	Regional cooperative personnel	Farmers	Noncooperative suppliers	Other dealers	University & Extension personnel	Publications & trade journals
<i>Rank (weighted mean)</i>						
Cooperative size						
Super	2.83	2.85	2.56	2.61	3.32	3.50
Large	2.91	2.90	2.24	2.42	3.60	3.88
Medium	2.74	2.67	2.14	2.29	3.84	3.99
Small	2.62	2.44	1.95	2.13	3.89	4.11
Cooperative type						
Marketing cooperative	2.54	2.31	2.00	2.08	3.38	3.96
Mixed marketing	2.78	2.71	2.37	2.56	3.62	3.76
Mixed farm supply	2.87	3.10	2.26	2.07	3.98	3.96
Specialized farm supply	2.89	2.79	2.03	2.26	3.75	3.97
Cooperatives that ceased to exist						
Average	2.83	2.81	1.86	2.01	3.69	4.02
Cooperative growth through merger or acquisition						
Average	2.63	2.60	2.40	2.46	3.99	4.09
All respondents, average	2.77	2.71	2.20	2.35	3.69	3.90

¹ Product selection ranked from 1 (most important) to 5 (least important).

SERVICES AND SALES TOOLS

When a farmer chooses a supplier for farm inputs, the choice typically involves a broad range of considerations including price, quality, reputation, and a variety of services. Farm supply organizations commonly use one of two basic selling strategies: low price-no service product sales or full service sales. By tailoring the proper mix of price and services, the cooperative or other farm supplier can achieve the greatest success. Thus, establishing the right price-services mix and communicating offerings in an effective manner become critical elements of the cooperatives' farm supply strategy.

If a cooperative offers services with its product sales, it is confronted with the question of how to recover the cost of the service. The service can be included automatically with the sale for no extra charge or treated as a separate charge item. It can

be provided at no additional cost if certain threshold quantity requirements are met. Services might be fully costed and charged, or only partially so. For example, short-run demand may prohibit the cooperative from charging for the full sunk cost of purchasing necessary equipment or the salaries of specialized staff who are knowledgeable in agronomy and plant sciences. Smaller cooperatives may find that the best way to offer additional services is to spread their costs over additional volume by sharing the equipment and/or personnel with a nearby cooperative. However service offerings and cost recovery are determined, the cooperative must have an accurate understanding of the costs of providing its services.

The needs and demands of farmers for products and services are constantly changing, as are the methods for reaching potential buyers. Successful farm supply cooperatives are attuned to

Table 33—Influences on the types and brands of fertilizers that a cooperative carries, 1985¹

Cooperative	Regional cooperative personnel	Farmers	Noncooperative suppliers	Other dealers	University & Extension personnel	Publications & trade journals
<i>Rank (weighted mean)</i>						
Cooperative size						
Super	3.71	3.68	3.18	3.10	3.48	3.55
Large	3.81	3.79	3.06	3.25	3.71	3.90
Medium	3.57	3.66	2.91	3.20	3.56	3.80
Small	3.71	3.77	2.97	3.18	3.64	3.84
Cooperative type						
Specialized marketing	3.45	3.39	3.10	3.27	3.51	3.76
Mixed marketing	3.69	3.67	3.05	3.12	3.61	3.70
Mixed farm supply	4.04	3.95	3.34	3.55	3.72	3.91
Specialized farm supply	3.67	3.77	3.06	3.37	3.70	4.03
Cooperatives that ceased to exist						
Average	3.36	3.48	3.67	3.65	3.91	3.89
Cooperative growth through merger or acquisition						
Average	3.91	3.93	2.93	3.04	3.69	4.11
All respondents, average	3.69	3.72	3.01	3.19	3.60	3.79

¹ Product selection ranked from 1 (most important) to 5 (least important).

the trends and how those trends will affect their businesses. For example, many farmers may be thinking of adopting some lower input type of farming either because of increased input costs or environmental concerns. Lower input farming would put much higher emphasis on crop management, a requirement that many large farm operators neither have the expertise in or time to undertake. Direct beneficiaries of farmers wishing reduction in the quantities of agricultural chemicals and fertilizer used will be farm input providers that offer crop management specialists, advisory services, disease monitoring, scouting, field mapping, and soil testing. Cooperatives have historically been full service suppliers of these types of inputs and services and are therefore relatively well positioned to deal with this trend.

Provision of Agronomy Services

When asked to indicate the services they offered in conjunction with agricultural chemical and fertilizer sales. More than 60 percent of respondent cooperatives indicated soil testing, product delivery, and application (table 34). The next most often offered services in order of their respective availability were advisory services, bulk tanks, disease monitoring, and scouting crop management specialist, field mapping, and infrared photography.

Mixed farm supply and specialized farm supply cooperatives were more likely to offer these services than either specialized marketing or mixed marketing cooperatives. In fact, for the most often offered services, soil testing, delivery, and application, 10 percent more mixed farm supply and specialized farm supply cooperatives offered the ser-

vices than either type of marketing cooperative. There were few differences in service offering by the different size classifications.

The data in table 34 provide two interesting contrasts. First, cooperatives that ceased to exist tended to be more likely to offer services than the average respondent. Second, cooperatives that grew through merger or acquisition tended to be less likely to offer the various services. While this might appear to suggest that the offering of services has a detrimental effect on the success of a cooperative, information presented later in this report will offer another explanation. As for the methods used to recover costs of providing ser-

vices, the cooperatives that ceased to exist were more likely to include services in the purchase price of the product. By contrast, cooperatives that grew depended almost exclusively on the charging of service fees to recover costs.

Two possibilities are suggested. First, cooperatives that include services as a part of product prices might be less attuned to their actual costs of operations and therefore less able to minimize costs. Second, cooperatives that separate the product from its services might be better able to meet the precise needs of individual customers, thus minimizing costs and improving the attractiveness of their overall offering.

Table 34—Percentage of respondent cooperatives offering selected agronomy services, 1985

Cooperative	Crop management specialists	Advisory services	Delivery service	Application service	Soil testing	Infrared photography	Disease monitoring, scouting	Mini- bulk tanks	Field mapping
<i>Percent</i>									
Cooperative size									
Super	39.06	39.06	67.19	67.19	65.63	7.81	50.00	53.13	32.81
Large	26.58	33.54	54.43	56.33	56.96	4.43	31.65	37.34	29.11
Medium	29.51	38.11	65.98	65.16	66.80	6.97	29.92	37.30	30.33
Small	23.08	42.69	67.69	62.31	63.85	3.85	20.77	28.08	21.15
Cooperative type									
Specialized marketing	21.05	28.07	59.65	56.14	59.65	1.75	17.54	36.84	29.82
Mixed marketing	22.99	34.90	55.40	55.68	59.00	4.16	28.25	36.29	24.10
Mixed farm supply	57.45	31.91	70.21	72.34	68.09	10.64	46.81	44.68	42.55
Specialized farm supply	29.50	47.89	76.25	71.26	69.73	6.90	28.74	32.18	27.59
Cooperatives that ceased to exist									
Average	34.07	47.25	72.53	74.73	79.12	6.59	41.76	40.66	34.07
Cooperative growth through merger or acquisition									
Average	29.41	33.33	52.94	54.90	56.86	1.96	25.49	37.25	23.53
All respondents, average	28.23	39.40	64.40	63.25	64.75	5.30	29.95	36.06	27.53

Respondent cooperatives included additional detail data on the provision of application services, the most capital intensive of the basic agronomy services. Most agricultural chemicals (63 percent) were sold directly to farmers without application service (table 35). Specialized marketing cooperatives (78 percent), and small cooperatives (75 percent) were more likely to sell agricultural chemicals directly, without application services. Cooperatives that diversified (mixed marketing and mixed farm supply) tended to be more service oriented. Diversified cooperatives applied or provided application equipment for farmers for about 44 percent of their sales, compared to the average 38 percent.

Larger cooperatives more often owned application equipment or custom applied agricultural chemicals for their patrons, implying the possible existence of economies of scale in application equipment services. If such economies exist, small cooperatives desiring to provide application services might find it advantageous to form joint application arrangements with other cooperatives.

Respondent cooperatives were asked if they recovered the cost of providing application services for agricultural chemical sales by 1) including the cost in product prices; 2) charging a service fee with a minimum purchase required to cover the cost; or 3) charging a service fee with no minimum

Table 35—Percentage of cooperative agricultural chemical sales applied by farmer, by farmer with cooperative equipment, or custom applied by cooperative, 1985

Cooperatives	Applied by farmer	Farmer applies with cooperative equipment	Custom applied by cooperative
<i>Percent (weighted average)</i>			
Cooperative size			
Super	36.78	10.98	36.78
Large	60.25	4.92	34.83
Medium	62.21	8.05	29.74
Small	75.39	6.41	18.19
Cooperative type			
Specialized marketing	78.14	3.77	18.09
Mixed marketing	56.02	7.07	36.90
Mixed farm supply	55.97	7.95	36.08
Specialized farm supply	68.67	7.14	24.19
Cooperatives that ceased to exist			
Weighted average	63.69	3.56	32.75
Cooperative growth through merger or acquisition			
Weighted average	54.35	4.16	41.49
All respondents	62.53	6.91	30.56

purchase required. Cooperatives involved in applying agricultural chemicals, recovered application costs by charging a service fee on 60 percent of their sales with no minimum purchase required (table 36). Application charges tended to be separated from product prices in larger cooperatives. Mixed marketing and mixed farm supply cooperatives which tended to be more service oriented also were more likely to charge a fee for services.

In direct contrast to agricultural chemical sales, where more than 62 percent of the product was applied by farmers using their own equipment, most fertilizer sales (73 percent) included either the use of cooperative-owned application equipment by the farmers or the cooperative custom applying the fertilizer for the farmer (table 37). This difference is most likely due to the more specialized equipment required for application of fertilizers.

Larger cooperatives and mixed farm supply cooperatives were more likely to offer the custom application of fertilizer. The relationship between cooperative size and provision of application services suggests there may be similar economies of scale in ownership of fertilizer application equipment as previously mentioned with agricultural chemicals.

In general, respondent cooperatives were more likely to charge an additional service fee for fertilizer application services without requiring a minimum purchase than for agricultural chemicals (table 38). Respondent cooperatives were slightly more likely, however, to include application services in the fertilizer product prices. Small cooperatives and specialized farm supply cooperatives were more likely to include application costs in product prices.

Table 36—Method of recovering cost of providing application service with the sales of agricultural chemicals, 1985

Cooperative	Include in product prices	Service fee, minimum purchase required	Service fee, no minimum purchase required
<i>Percent (weighted average)</i>			
Cooperative size			
Super	10.53	32.70	56.77
Large	9.96	20.94	69.10
Medium	17.47	25.25	57.28
Small	22.85	19.63	57.51
Cooperative type			
Specialized marketing	22.52	5.24	72.24
Mixed marketing	11.24	27.21	61.56
Mixed farm supply	6.93	33.82	59.25
Specialized farm supply	20.27	23.36	56.37
Cooperatives that ceased to exist			
Weighted average	22.52	15.28	62.21
Cooperative growth through merger or acquisition			
Weighted average	1.30	43.41	55.29
All respondents	15.07	24.58	60.35

Table 37—Percentage of cooperative fertilizer sales applied by farmer, by farmer with cooperative equipment, or custom applied by cooperative, 1985

Cooperatives	Applied by farmer	Farmer applies with cooperative equipment	Custom applied by cooperative
<i>Percent (weighted average)</i>			
Cooperative size			
Super	21.11	38.14	40.75
Large	24.82	32.64	42.54
Medium	26.54	36.74	36.72
Small	33.60	38.46	27.95
Cooperative type			
Specialized marketing	25.40	39.22	35.38
Mixed marketing	25.83	35.13	39.04
Mixed farm supply	22.84	37.18	39.98
Specialized farm supply	29.57	37.05	33.38
Cooperatives that ceased to exist			
Weighted average	23.32	39.78	36.89
Cooperative growth through merger or acquisition			
Weighted average	34.59	30.98	34.42
All respondents	26.93	36.33	36.74

Table 38—Method of recovering cost of providing application service with fertilizer sales, 1985

Cooperative	Include in product prices	Service fee, minimum purchase required	Service fee, no minimum purchase required
<i>Percent (weighted average)</i>			
Cooperative size			
Super	16.63	30.71	52.66
Large	14.56	19.70	65.74
Medium	16.06	34.53	49.41
Small	27.13	23.00	49.87
Cooperative type			
Specialized marketing	18.93	13.36	67.71
Mixed marketing	16.13	26.08	57.79
Mixed farm supply	7.07	30.66	62.27
Specialized farm supply	24.90	28.13	46.98
Cooperatives that ceased to exist			
Weighted average	24.36	20.10	55.54
Cooperative growth through merger or acquisition			
Weighted average	15.51	28.29	56.21
All respondents	18.85	26.44	54.71

Sales Tools

Respondent cooperatives rated a number of services and sales tools or methods in terms of their importance in keeping existing patrons. These tools included advisory and application services, advertising, price, handling other supplies, and marketing other farm products. Each was ranked on a 1 to 5 scale with a 1 meaning "most important" and a 5 meaning "least important." Using the same scale, respondents were also asked what services and sales tools or methods were most important for gaining new customers or patrons.

Agricultural Chemicals The advisory services and advertising were the most highly rated methods or tools for keeping agricultural chemical patrons (table 39). Obviously, if cooperative employees who were experts in detecting crop problems correctly advised farmers which chemicals eradicated various pests, the farmer would be more likely to continue to purchase inputs from that cooperative. Advertising informed current patrons of new products that combated specific pests and the availability of all products and services. The provision of application service was rated the least important tool. There were few differences in opinion among respondents representing the various size and type categories.

Table 39—Importance of advisory services, advertising, and other sales tools in keeping agricultural chemical patrons, 1985 ¹

Cooperative	Price	Application services	Advisory services	Advertising	Handling other supplies	Marketing other farm products
<i>Rank (weighted mean)</i>						
Cooperative size						
Super	2.15	2.26	1.63	1.91	2.11	2.15
Large	2.06	2.24	1.65	1.76	2.38	2.17
Medium	2.04	2.16	1.56	1.60	2.18	2.00
Small	1.96	2.03	1.53	1.59	2.51	2.15
Cooperative type						
Specialized marketing	2.08	2.15	1.69	1.77	2.40	2.39
Mixed marketing	2.06	2.19	1.62	1.77	2.31	2.15
Mixed farm supply	2.32	2.38	1.94	1.91	2.33	2.33
Specialized farm supply	1.95	2.09	1.56	1.64	2.37	2.02
Cooperatives that ceased to exist						
Average	2.00	2.11	1.57	1.55	2.07	2.03
Cooperatives growth through merger or acquisition						
Average	2.03	1.99	1.53	2.02	2.12	2.05
All respondents, average	2.05	2.17	1.59	1.70	2.30	2.11

¹ Tools ranked from 1 (most important) to 5 (least important).

To gain new customers, respondent cooperatives felt that handling other supplies and marketing farm products were most important (table 40). These activities gained customer traffic in the outlet making sales of other items possible. Advisory services and application services were the second and third highest rated sales tools. None of the sales tools included in the list were highly ranked, in an absolute sense, in terms of their effectiveness in attracting new customers. With ranking factors from 1 to 5, respondents gave most sales tools for gaining new customers a rather low mean ranking of 3. This would point either to the difficulty of obtaining new customers in a mature farming mar-

ket or to the failure of the survey to include other tools more effective in gaining new customers.

Fertilizer Respondent cooperatives ranked the same set of sales tools or methods for keeping the business of fertilizer patrons. Except for small cooperatives, the highest rated tools were application services and price (table 41). Small cooperatives felt that handling other farm supplies was slightly more important than price. The high rating for application services might be expected, since most of the fertilizer sold by respondent cooperatives was applied by using the cooperatives' equipment or by the cooperatives themselves. As would also be expected, in sales of

Table 40—Importance of selling other farm products, and other sales tools in gaining new agricultural chemical patrons, 1985¹

Cooperative	Price	Application services	Advisory services	Advertising	Handling other supplies	Marketing other farm products
<i>Rank (weighted mean)</i>						
Cooperative size						
Super	3.96	3.99	3.56	3.63	3.03	3.03
Large	3.94	4.01	3.78	3.77	3.18	3.32
Medium	3.75	3.83	3.29	3.32	3.09	3.08
Small	3.80	3.84	3.46	3.43	3.01	3.03
Cooperative type						
Specialized marketing	3.98	4.02	3.66	3.56	2.84	2.81
Mixed marketing	3.89	3.92	3.50	3.52	3.22	3.24
Mixed farm supply	3.77	3.76	3.58	3.55	2.87	3.13
Specialized farm supply	3.90	3.97	3.55	3.59	3.16	3.20
Cooperatives that ceased to exist						
Average	3.92	4.04	3.66	3.67	3.51	3.55
Cooperative growth through merger or acquisition						
Average	3.74	3.76	3.47	3.47	3.26	3.17
All respondents, average	3.85	3.91	3.50	3.52	3.08	3.12

¹ Tools ranked from 1 (most important) to 5 (least important).

Table 41—Importance of advisory services, advertising, and other sales tools in keeping fertilizer patrons, 1985¹

Cooperative	Price	Application services	Advisory services	Advertising	Handling other supplies	Marketing other farm products
<i>Rank (weighted mean)</i>						
Cooperative size						
Super	2.06	1.95	2.28	2.37	2.32	2.32
Large	2.17	2.10	2.35	2.38	2.34	2.38
Medium	2.00	1.99	2.41	2.40	2.29	2.38
Small	2.34	2.06	2.48	2.44	2.32	2.33
Cooperative type						
Specialized marketing	2.30	2.34	2.34	2.53	2.56	2.51
Mixed marketing	2.27	2.12	2.51	2.54	2.40	2.43
Mixed farm supply	2.17	2.28	2.42	2.37	2.42	2.38
Specialized farm supply	2.10	1.95	2.38	2.36	2.30	2.44
Cooperatives that ceased to exist						
Average	1.93	1.83	2.31	2.33	2.33	2.26
Cooperative growth through merger or acquisition						
Average	2.00	1.79	2.22	2.14	2.00	1.93
All respondents, average	2.14	2.03	2.39	2.40	2.32	2.36

¹ Tools ranked from 1 (most important) to 5 (least important).

a bulky, non-differentiated product (lacking name brands), price would be a highly important sales determinant.

As with agricultural chemical patrons, the listed tools for gaining fertilizer patrons were not rated as being highly important (table 42). With the exception of the offering of other farm supplies and product marketing, the other potential tools were rated of approximately equal importance. Of this set, advertising was judged most important in attracting new fertilizer patrons. Although fertilizers are generally marketed as an unbranded product, advertising informed prospective patrons regarding the prices and types of products and services available. Price was judged to be the second

most important item in gaining new fertilizer patrons. Price was most important to small cooperatives, but deemed less important by all other cooperative size classes. Application and advisory services were ranked nearly as important as price and advertising by all respondents.

TRADE TERRITORIES

Cooperatives were asked to estimate the radius, in miles, of trade territories in which they obtained 50, 75, and 95 percent of their total agricultural chemical and fertilizer sales volumes (table 43). The average radius within which respondent cooperatives obtained 50 percent of their total fer-

Table 42—Importance of selling other farm supplies, marketing farm products, and other sales tools in gaining new fertilizer patrons, 1985¹

Cooperative	Price	Application services	Advisory services	Advertising	Handling other supplies	Marketing other farm products
<i>Rank (weighted mean)</i>						
Cooperative size						
Super	2.93	2.96	2.56	2.45	2.96	2.85
Large	3.35	3.35	3.18	3.15	3.34	3.30
Medium	3.17	3.18	3.16	3.12	3.31	3.21
Small	3.10	3.14	3.83	3.77	3.87	3.90
Cooperative type						
Specialized marketing	2.77	2.74	2.35	2.39	2.67	2.59
Mixed marketing	3.33	3.32	2.93	2.88	3.21	3.17
Mixed farm supply	3.00	3.05	3.22	3.23	3.33	3.23
Specialized farm supply	3.21	3.24	3.83	3.78	3.90	3.87
Cooperatives that ceased to exist						
Average	3.50	3.52	3.51	3.57	3.72	3.67
Cooperative growth through merger or acquisition						
Average	3.13	3.20	2.67	2.64	2.74	2.68
All respondents, average	3.16	3.18	3.20	3.14	3.38	3.32

¹ Tools ranked from 1 (most important) to 5 (least important).

tilizer and chemical business was about 9 miles and about 22 miles for 95 percent of their business.

Of all the cooperative types that sold 95 percent of their agricultural chemicals and fertilizers, specialized farm supply cooperatives had the largest trade territory radius, 27 miles with their territories about 5 miles larger than the average respondent cooperative. Of all sizes of cooperatives, small cooperatives had the largest trade territories, (more than 27 miles) by about 1.5 miles. Cooperatives that ceased to exist had a trade territory 3 miles larger than the average cooperative. Cooperatives that grew through merger or acquisition had a radius about 6 miles larger than the average cooperative.

COMPETITOR ANALYSIS

Respondents also indicated the number of each of a variety of types of competitors within their primary trade territory. Clearly, the nature and extent of competition in a market influenced the cooperatives' operations regarding sales methods, prices, and services. Based strictly on the number of competitors, which averaged a little more than 22 in agricultural chemicals and 21 in fertilizer, most local cooperatives face considerable competition within their trade territory. No indication was given regarding, however, the intensity of the competitive pressure from each of the competitors (tables 44 and 45).

Table 43—Trade territory radius for agricultural chemical and fertilizer sales, 1985

Cooperative	Radius of trade territory in miles to sell:					
	50% of agricultural chemicals	75% of agricultural chemicals	95% of agricultural chemicals	50% of fertilizer	75% of fertilizer	95% of fertilizer
<i>Miles (weighted means)</i>						
Cooperative size						
Super	7.99	12.69	20.72	7.62	12.14	19.93
Large	9.09	14.78	21.44	9.07	14.73	21.64
Medium	9.31	14.61	21.81	9.07	15.76	21.69
Small	10.06	15.93	23.20	9.97	16.37	23.70
Cooperative type						
Specialized marketing	6.87	11.02	16.65	7.15	12.04	17.61
Mixed marketing	8.09	13.08	19.57	7.85	13.11	19.57
Mixed farm supply	8.21	13.15	18.78	8.27	13.30	18.94
Specialized farm supply	10.96	17.41	26.42	10.87	18.32	26.71
Cooperatives that ceased to exist						
Average	8.31	16.00	24.92	8.26	15.94	24.66
Cooperative growth through merger or acquisition						
Average	11.63	18.49	28.16	11.59	17.74	27.90
All respondents, average	9.13	14.54	21.84	8.96	14.87	21.83

Cooperatives faced competition from other cooperatives, investor-owned firms, product manufacturers, and lawn and garden stores. The mix of competitors, by type, was fairly consistent in fertilizer and chemicals. The typical cooperative faced competition from about four other cooperatives, five non-cooperative distributors, four dealers and brokers, two manufacturers' representatives and six lawn and garden or other retail stores.

Large cooperatives tended to face the most competitors. Most significantly, their trade territories were characterized by more cooperative competitors, but less pressure from manufacturers representatives. Small cooperatives had less

competitors even though they had one of the biggest trade territories. This suggests that there was a lower density of customers in small cooperatives' trade territories and thus fewer competitors. Mixed farm supply and specialized farm supply cooperatives perceived greater numbers of non-cooperative competitors than did mixed marketing and specialized marketing cooperatives, particularly within the dealer and broker and the lawn, garden, and other store categories.

Cooperatives that ceased to exist had relatively fewer competitors in selling agricultural chemicals, averaging just two more than small cooperatives, suggesting that perhaps a less desirable trade

Table 44—Types of competitors facing cooperatives selling agricultural chemicals, 1985

Cooperative	Other cooperatives	Noncooperative distributors	Dealers & brokers	Manufacturers' representative	Lawn and garden, hardware, and discount stores
<i>Number of competitors (weighted mean)</i>					
Cooperative size					
Super	4.62	6.58	3.58	2.29	6.25
Large	3.98	5.18	6.56	2.93	7.39
Medium	3.64	5.86	3.88	3.15	6.01
Small	3.16	3.47	3.52	3.10	4.94
Cooperative type					
Specialized marketing	4.71	3.77	2.03	2.17	3.79
Mixed marketing	3.46	4.55	3.50	2.58	5.27
Mixed farm supply	4.78	6.38	7.72	3.86	10.46
Specialized farm supply	3.81	5.71	6.00	3.59	7.65
Cooperatives that ceased to exist					
Average	3.10	4.97	4.08	2.16	5.80
Cooperative growth through merger or acquisition					
Average	5.01	4.78	6.58	3.16	11.09
All respondents, average	3.80	5.23	4.36	2.89	6.16

territory contributed to their demise. Cooperatives that grew through merger or acquisition may have done so to gain the sales volume necessitated to compete. With an average of 30 competitors, they faced the most competition. Although merger or acquisition eliminated one cooperative competitor, merged or acquired cooperatives still faced other cooperatives as major sources of competition.

Different types of competitive pressures were exerted on respondents by each category of competitor. The cooperative competitors may have had the same product source so that competition would center on product availability, quality of services, general performance, and cost of additional ser-

vices offered. The average respondent had an estimated 10 non-cooperative distributor, dealer, and broker competitors in its trade territory. Distributors and brokers often offered the same services and equipment. Within this group, the competition for cooperatives was characterized by increased focus on price.

An average of three manufacturers' representatives operated in each respondent cooperatives' territories. This type of competitor presumably had excellent product access and low prices. The competition between cooperatives and manufacturer's representatives was characterized as a battle between the strong distribution and service orien-

Table 45—Types of competitors facing cooperatives selling fertilizer, 1985

Cooperative	Other cooperatives	Noncooperative distributors	Dealers & brokers	Manufacturers' representative	Lawn and garden, hardware, and discount stores
<i>Number of competitors (weighted mean)</i>					
Cooperative size					
Super	4.65	6.67	3.56	1.76	5.74
Large	3.92	5.34	5.95	2.40	7.37
Medium	3.64	5.64	3.81	2.78	5.63
Small	3.13	3.23	3.40	2.44	4.84
Cooperative type					
Specialized marketing	4.62	3.76	2.05	2.06	3.63
Mixed marketing	3.46	4.50	3.47	1.77	5.06
Mixed farm supply	4.65	6.17	7.71	2.20	10.88
Specialized farm supply	3.80	5.88	5.23	4.14	7.22
Cooperatives that ceased to exist					
Average	3.10	4.75	3.11	1.84	4.77
Cooperative growth through merger or acquisition					
Average	5.10	4.82	6.63	1.83	11.79
All respondents, average	3.79	5.14	4.22	2.39	5.93

tation of cooperatives and the price-orientation of manufacturers.

Lawn and garden, hardware, and discount stores had more recently become the most numerous competitors of agricultural cooperatives, with an average of six of these outlets in each respondent's territory. Cooperatives have become increasingly aware that both farmers and urban consumers are a lucrative lawn and garden market and have set aside parts of their existing outlets or added new facilities for these product sales. By repackaging agricultural chemicals and fertilizers in conveniently sized containers or bags and employing personnel knowledgeable in lawn and

garden problems, these cooperative operations were often very profitable.

CONCLUSIONS AND CHALLENGES FOR LOCAL COOPERATIVES

Local agronomy cooperatives, demonstrated collective strength and vitality throughout the extremely difficult period for agriculture in the 1980's. They survived a period marked by intense competition, tremendous market and product uncertainty, and erosion of their patron base.

During the 1980's, local agronomy cooperatives increased sales volumes, improved their cost

performance, added or improved services, sharpened their competitive and strategic outlook, and improved their overall financial condition.

Considerable restructuring of the cooperative sector occurred at the local level during the period of this study. The net result is a local cooperative system that has eliminated many weaker and less efficient operations while strengthening those better suited to meet the needs of agriculture.

In contrast to much of the rest of the agricultural sector, many of the respondent cooperatives had little or no long-term debt. Use of debt declined and owner equity increased in local agronomy cooperatives in the 1980's. Owner equity was a very strong indicator of financial strength, especially evident in the more successful cooperatives that grew through merger or acquisition. The result of this tightening of the balance sheet is to better prepare local cooperatives to meet the challenges of the future, giving them greater flexibility and capability to change and invest in new opportunities.

Although expensive to own and maintain, application equipment and services were important to fertilizer patrons. The cost of services offered in conjunction with agricultural chemical and fertilizer sales must be recovered through a fee charged to those who use the service and not be included in overall product prices.

There was a very competitive market for retail sales of agricultural chemicals and fertilizers—usually nine non-cooperative distributors, dealers and brokers of agricultural chemicals or fertilizers in any one cooperative's trade territory. These competitors exerted the most influence on what types and brands of these two products that cooperatives sold.

For many cooperatives, their strongest competitor in the agronomy market was another cooperative. Over the 8 years covered in this report, more than 10 percent of the respondent cooperatives to the ACF survey no longer existed. This suggested that there were even more expected consolidations of local cooperatives in the near future as they discovered the benefits of economies of size in order to still be a low-cost provider of agricultural inputs to their members.

In the next 10 years there will be numerous changes in the agricultural chemical and fertilizer retail markets. The largest impact on these markets will probably come from increasing environmental concerns, market restructuring, and alternative agricultural/biotechnological advances.

Environmental Concerns

Cooperatives and investor-owned firms will both face challenges in formulation, use, and storage of agricultural chemicals and fertilizers. To the uninformed public, the words "agricultural chemicals" themselves conjure up a threat. The public needs to be made fully aware that farmers try to operate both profitably and safely and that they would not unnecessarily incur additional costs of using more than the prescribed amount of agricultural chemicals or fertilizers.

Local cooperatives themselves often need to do a better job maintaining their buildings, application equipment, and especially the agricultural chemical warehouse and fertilizer plants. In addition to complying with all Federal and State laws and regulations, moving fertilizer plant and chemical-mixing facilities from high traffic and population areas to more isolated sites would allay many local public concerns, foster goodwill, and improve the appearance of many communities.

Market Restructuring

The cooperative marketing and distribution system will continue to evolve and change in response to the agricultural market. There will be fewer farmers and farms. The number of cooperatives will also decrease as mergers and acquisitions strengthen and better position surviving cooperatives.

In this report, cooperatives that grew through merger or acquisition appear to be stronger financially and thus should be able to better serve their members. A number of the cooperatives that ceased to exist were located in counties with more than one cooperative. Also, when asked who their competitors were, cooperative respondents indicated five other cooperative competitors in their trade

territories. This suggests considerable duplication of resources and unnecessary costs for farmers owning cooperatives in the farm input market.

Alternative Agricultural/ Biotechnological Advances

Farmers' usage of agricultural chemicals and fertilizers may decrease in the near future because of the cost of using them as well as from environmental concerns. A number of farmers have adopted low-input sustainable agricultural practices and been successful. Future biotechnological advances in plant breeding may change plants' need for both fertilizers and agricultural chemicals. Both of these changes may reduce the quantities of agricultural chemicals and fertilizers purchased from cooperatives.

Many local cooperatives already have field representatives who will help farmers determine how to combat pests in low-input sustainable agriculture. These same representatives could be trained to recognize the requirements of plants that have been developed through biotechnology. By having well-trained field representatives, local cooperatives can position themselves to serve this evolving market and replace revenues lost to agricultural chemicals and fertilizers with service income from their field representatives.

BIBLIOGRAPHY

- Barse, Joseph R., "Seven Farm Input Industries," U.S. Department of Agriculture, Economic Research Service, AER No. 635, September 1990.
- Dunn, John R., and Donald L. Vogelsang, "Fertilizer Operations of Regional and Interregional Cooperatives, 1984," U.S. Department of Agriculture, Agricultural Cooperative Service, RR No. 60, May 1987.
- Leibenluft, Robert F., "Competition in Farm Inputs: An Examination of Four Industries," Office of Policy Planning, Federal Trade Commission, February 1981.
- Richardson, Ralph M., et al., "Farmer Cooperative Statistics," U.S. Department of Agriculture, Agricultural Cooperative Service, SR No. 29, December 1990.
- Royer, Jeffrey S., Roger A. Wissman, and Charles A. Kraenzle, "Farmer Cooperatives Financial Profile, 1987," U.S. Department of Agriculture, Agricultural Cooperative Service, RR No. 91, September 1990.
- Vogelsang, Donald L., J. Warren Mather, and E. Eldon Eversull, "Cooperative Agrichemical and Seed Operations," U.S. Department of Agriculture, Agricultural Cooperative Service, CIR 1, Section 22, April 1990.
- Zilberman, David, and Jerome B. Siebert, "Economic Perspectives on Pesticide Use in California," Department of Agricultural and Resource Economics, University of California, Berkeley, October 1990.

**U.S. Department of Agriculture
Agricultural Cooperative Service**

P.O. Box 96576

Washington, D.C. 20090-6576

Agricultural Cooperative Service (ACS) provides research, management, and educational assistance to cooperatives to strengthen the economic position of farmers and other rural residents. It works directly with cooperative leaders and Federal and State agencies to improve organization, leadership, and operation of cooperatives and to give guidance to further development.

The agency (1) helps farmers and other rural residents develop cooperatives to obtain supplies and services at lower cost and to get better prices for products they sell; (2) advises rural residents on developing existing resources through cooperative action to enhance rural living; (3) helps cooperatives improve services and operating efficiency; (4) informs members, directors, employees, and the public on how cooperatives work and benefit their members and their communities; and (5) encourages international cooperative programs.

ACS publishes research and educational materials and issues *Farmer Cooperatives* magazine. All programs and activities are conducted on a nondiscriminatory basis, without regard to race, creed, color, sex, age, marital status, handicap, or national origin.